Increasing yield: Scientific research conducted by agricultural engineers enhances agricultural product quality and quantity. Inset Dr Samsuzana

Engineering modern agriculture

Agricultural engineers have a bigger role to play now that traditional farming methods are being integrated with technology.

OUR world population is growing. We will need more food, fibre, water, energy and other essentials.

Universiti Putra Malaysia (UPM) Biological and Agricultural Engineering Department head Dr Samsuzana Abd Aziz said there is a need to have solutions that create a cleaner, safer, sustainable and better planet.

"We need watershed restoration, practice of efficient, low-impact technologies, biodegradable products, innovative food production systems, better handling of precious harvests and improved waste water treatment and reused systems," she said.

Sound like science fiction? Are these things even possible? Yes! It is possible through the work of agricultural engineers.

Initially man used the hoe, the plough and the beast in farming. Eventually, the need to increase productivity and making farm work less arduous and more attractive made man observe more closely plant materials, land, water and air in order to improve the performance of the equipment used. This then led to an engineering discipline especially for agriculture known as agricultural engineering.

"Today, agricultural engineering reaches far into every activity of agriculture and modernises farming so that quality food can be produced sufficiently and continuously.

"Everyone needs food to live on," said the lecturer who has spent the last eight years at UPM producing Agricultural and Biosystems Engineers.

My job involves ...

● in line with the aspiration of the country to empower agriculture in order to ensure the sustainability of food supply and the generation of high income, my job is to ensure that the programme in UPM runs smoothly in the course of producing agricultural engineers. My research activities mainly focus on agricultural and biosystems instrumentation, computational intelligence and geographic information system. More specifically, it is the integration of artificial intelligence with geospatial system through programming, the application of which, among others, are in the accurate placement and metering of fertilisers and in the automatic control of agricultural inputs for efficient farming.

Experts in the making: UPM is the only institution in Malaysia which offers students a chance to pursue an undergraduate engineering degree in agricultural and biosystems.

To qualify, you need ...

● to become an agricultural engineer. You need at least a bachelor's degree. Students can apply to do a Bachelor of Engineering (Agricultural and Biosystems) in UPM (the only university in Malaysia that offers the degree) or overseas. A master's programme focuses on research, allowing the student to develop an advanced understanding of a particular aspect of agricultural engineering, which may allow for greater employment opportunities within that specialty. A master's degree presents more opportunities for an individual to work in more research-related positions in the field of agricultural engineering.

Prospects for the future ...

● at the heart of modern farming is the agricultural engineer whose roles are many and varied. Farmers employ farm machinery, equipment and modern farming methods developed by agricultural engineers. The global demand for more sufficient and healthier foods, utilisation of bio-based energy and cleaner environments have only reinforced the importance of agricultural engineering.

The experts in this field are instrumental in making farm work modern, safe and attractive, ensuring eco-friendly on- and off-farm processing and searching for new use of agricultural by-products and wastes. These activities, being the fundamentals of modern, safe and health conscious living, have wide-ranging ramifications for the job market. Developing climate control systems for enhanced animal comfort and growth, improving satellite applications for precision farming in oil palm plantations and increasing cooling efficiency and storage capacity of cold rooms for agricultural produce are a few examples.

I love my job because ...

● I go home every day with the firm belief that the work I do helps make the world a better place.

What I dislike most about my job ...

● being a lecturer who teaches one of the most important disciplines in the world, it is hard think that in Malaysia, many are still not aware of the important roles of agricultural engineers.

Will I be a millionaire by 30?

● in the government sector, agricultural engineers are paid based on the engineers' salary scale. The salary could be higher if one is employed in the private sector to develop a technology for commercialisation. The world can't feed the estimated 10 billion inhabitants in 2050. There is no doubt that we need agricultural engineers.

As Jim Rogers, investment whiz and best-selling author said, "If you want to become rich, become a farmer." To which I might add "not only a farmer but an engineer to the farmers."

Info Box:

● In 1975, a bachelor level programme in agricultural engineering started in Malaysia — at the Faculty of Agricultural Engineering, Universiti Pertanian Malaysia (now known as Universiti Putra Malaysia), Serdang, Selangor. A three-year diploma level programme was introduced in 1980 to produce technical assistants in the field followed not long after that by the Master's and PhD programmes in 1982.

● The programme is now known as the Bachelor of Engineering (Agricultural and Biosystems) and recognised by the Public Service Department, the Institution of Engineers Malaysia (IEM), Board of Engineers Malaysia (BEM) and the Engineering Accreditation Council of Malaysia (EAC). It is also recognised internationally by the Washington Accord.

● The Malaysian Society of Agricultural Engineers (MSAE), formed in 1982, is a professional organisation whose members are actively involved in the application of engineering and technology in agriculture, food production and the utilisation of biological materials.